

[Document Type] CLAIMS

[Claim 1]

A blade-pitch-angle control device used for a wind power generator having a plurality of blades, the blade-pitch-angle control device comprising:

- a memory device in which predetermined parameters that affect the load fluctuation of the blades, azimuth angles, and pitch-angle command values are stored in association with each other;

- an azimuth-angle detecting device that detects the azimuth angle of each of the blades;

- a parameter-detecting device that detects the predetermined parameters;

- a command-value receiving device that receives the pitch-angle command values for each of the blades from the memory device, the pitch-angle command values being selected on the basis of the azimuth angle of each blade detected by the azimuth-angle detecting device and the predetermined parameters detected by the parameter-detecting device; and

- a pitch-angle-control command-value generating device that generates pitch-angle-control command values for individually controlling the pitch-angle of each blade on the basis of the pitch-angle command values received by the command-value receiving device and a common-pitch-angle command value that is common to each blade, the common-pitch-angle

command value being determined by output information of the wind power generator.

[Claim 2]

The blade-pitch-angle control device according to claim 1, wherein the pitch-angle command values stored in the memory device are set to values in which the wind shear characteristics at the installation location of the wind power generator are reflected.

[Claim 3]

The blade-pitch-angle control device according to claim 1,

wherein the predetermined parameters comprise the wind speed, and

the parameter-detecting device is a wind-speed estimating device that includes a characteristic table relating the wind speed and an output of the wind power generator and that estimates the wind speed by reading out a wind speed corresponding to the output of the wind power generator from the characteristic table.

[Claim 4]

The blade-pitch-angle control device according to claim 1, further comprising:

a frequency-component extraction device that extracts a frequency component corresponding to an integral multiple of the number of blades from any one of the power generation output of the wind power generator, the number of revolutions of the power

generator, and the number of rotor revolutions; and

a calculation device that calculates a pitch-angle for eliminating the load fluctuation due to the frequency fluctuation on the basis of the extracted frequency-component,

wherein the pitch-angle-control command-value generating device causes the pitch-angle calculated by the calculation device to be reflected in the pitch-angle-control command value.

[Claim 5]

A wind power generator having a plurality of blades, comprising:

a blade-pitch-angle control device including

a memory device in which predetermined parameters that affect the load fluctuation of the blades, azimuth angles, and pitch-angle command values are stored in association with each other;

an azimuth-angle detecting device that detects the azimuth angle of each of the blades;

a parameter-detecting device that detects the predetermined parameters;

a command-value receiving device that receives the pitch-angle command values for each of the blades from the memory device, the pitch-angle command values being selected on the basis of the azimuth angle of each blade detected by the azimuth-angle detecting device and the predetermined parameters detected by the parameter-detecting device; and

a pitch-angle-control command-value generating device that generates pitch-angle-control command values for individually controlling the pitch-angle of each blade on the basis of the pitch-angle command values received by the command-value receiving device and a common-pitch-angle command value that is common to each blade, the common-pitch-angle command value being determined by output information of the wind power generator.

[Claim 6]

A blade-pitch-angle control device used for a wind power generator having a plurality of blades, the blade-pitch-angle control device comprising:

load-measuring devices that measure a load applied to the blades or mechanical parts constituting a windmill at predetermined azimuth angles;

an adjusting pitch-angle command-value generating device that generates an adjusting pitch-angle command value for each blade for reducing the load measured with each of the load-measuring devices; and

a pitch-angle-control command-value generating device that generates a pitch-angle-control command-value for each blade by causing the adjusting pitch-angle command value generated for each blade to be reflected in a common-pitch-angle command value for equally controlling the blades.

[Claim 7]

A blade-pitch-angle control device used for a wind power generator having a plurality of blades, the blade-pitch-angle control device comprising:

load-measuring devices that measure a load applied to the blades or mechanical parts constituting a windmill at predetermined azimuth angles;

a calculation device that calculates a periodic fluctuation of the load on the basis of the measured values measured by the load-measuring devices;

an adjusting pitch-angle command-value generating device that generates an adjusting pitch-angle command value for each blade for reducing a load fluctuation on the basis of the calculation results of the calculation device; and

a pitch-angle-control command-value generating device that generates a pitch-angle-control command-value for each blade by causing the adjusting pitch-angle command value generated for each blade to be reflected in a common-pitch-angle command value for equally controlling the blades.

[Claim 8]

The blade-pitch-angle control device according to claim 6,

wherein each of the load-measuring devices includes
an azimuth-angle measuring device that measures the azimuth angle of each blade at predetermined time intervals,
a trigger-generating device that generates a trigger

signal when the measurement result matches a predetermined azimuth angle, and

a measuring device that measures a load on the basis of the trigger signal.

[Claim 9]

The blade-pitch-angle control device according to claim 6,

wherein each of the load-measuring devices includes

an encoder that generates a trigger when the azimuth angle reaches a predetermined angle, and

a measuring device that measures a load on the basis the trigger.

[Claim 10]

A wind power generator having a plurality of blades, comprising:

a blade-pitch-angle control device including

load-measuring devices that measure a load applied to the blades or mechanical parts constituting a windmill at predetermined azimuth angles;

an adjusting pitch-angle command-value generating device that generates an adjusting pitch-angle command value for each blade for reducing the load measured with each of the load-measuring devices; and

a pitch-angle-control command-value generating device that generates a pitch-angle-control command-value for each

blade by causing the adjusting pitch-angle command values generated for each blade to be reflected in a common-pitch-angle command value for equally controlling the blades.